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TRYPANOSOMA RHODESIENSE.

By J. W. W. STEPHENS, M.D., D.P.H., and H. B. FANTHAM, D.Sc., B.A.

It has been assumed until recently that sleeping sickness was caused by one species of trypanosome, *T. gambiense*, which was conveyed solely by one species of tsetse fly, *Glossina palpalis*. We believe that this view is not correct. In February 1910 one of us (J. W. W. S.) noticed in the blood of a rat, inoculated from a case of sleeping sickness then under treatment in Liverpool, that the trypanosome showed peculiarities of structure which had not been seen before in *T. gambiense*. The morphological peculiarity was the presence of a posteriorly placed nucleus in some of the short or stumpy trypanosomes. We were unable, after prolonged search, to find these posterior nuclear forms in animals infected with *T. gambiense*. After careful study we came to the conclusion that we were dealing with a new species of trypanosome in man also causing sleeping sickness. We arrived at this view almost entirely on the grounds of the morphology of the trypanosome. Some of the short, stumpy forms have the nucleus either near or actually posterior to the blepharoplast (kinetic nucleus). This morphological feature is so striking that we can recognise this trypanosome with certainty (when inoculated into animals) from *T. gambiense*, or indeed any other known trypanosome.

In addition, there was subsidiary evidence that we were dealing with a new trypanosome, thus—

1. The case came from a region in N.E. Rhodesia where no *Glossina palpalis* is known, but where *G. morsitans* abounds, and the patient also passed through a region where *G. fusca* is found. This difference of carrier (probably *G. morsitans*) also supports the view that the trypanosome is a new species.

2. The pathogenicity of this trypanosome is distinctly more virulent than any strain of *T. gambiense* yet described, as has been pointed out by Yorke and by one of us (H. B. F.) with J. G. Thomson.

3. It has also been shown that *T. rhodesiense* produces well-marked œdema in the face of sheep, a condition which has not so far been recorded in the case of *T. gambiense*.

4. It produces keratitis in dogs, while *T. gambiense* does not.

5. Already a case of sleeping sickness has occurred in Nyasaland in which *T. rhodesiense*, with its morphological peculiarity, has been found.

6. We have carefully measured one thousand specimens of *T. rhodesiense*, and we have constructed a curve which differs distinctly from Bruce's curve of *T. gambiense*.

7. Action of human serum on *T. gambiense* and *T. rhodesiense*. Mesnil and Ringenbach (1911) have shown that human serum mixed with a dose of *T. rhodesiense* (which infects control animals in twenty-four hours) generally completely prevents infection in mice; whereas human serum mixed with *T. gambiense* (although it is less virulent than *T. rhodesiense*) has no preventive or curative action whatsoever.

8. *Trypanolysis*.—Mesnil and Ringenbach have also shown that the sera of animals (man, monkey, guinea-pig, etc.) infected with *T. gambiense* are

trypanolytic for the homologous trypanosome, *i.e.* *T. gambiense*, but have no action on the heterologous trypanosome, *i.e.* *T. rhodesiense*.

9. Kinghorn has recently telegraphed that he has succeeded in transmitting *T. rhodesiense* by *G. morsitans*.

It appears to us that the foregoing evidence is strongly confirmatory of the view we put forward in our original paper, namely, that we have two trypanosomes producing sleeping sickness in man, namely, *T. gambiense* and *T. rhodesiense*, and that the carrier of this latter species is *Glossina morsitans*.

REFERENCES.

- STEPHENS AND FANTHAM . . . *Proc. Roy. Soc. London*, 1910, B., vol. lxxxiii.
pp. 27-33.
YORKE, W. *Ann. Trop. Med. and Parasitol.*, 1910, vol. iv.
pp. 351-368.
FANTHAM AND J. G. THOMSON . . . *Ibid.*, 1911, vol. iv. pp. 417-463.
STANNUS AND YORKE . . . *Proc. Roy. Soc. London*, 1911, B., vol. lxxxiv.
pp. 156-160.
MESNIL AND RINGENBACH . . . *Compt. rend. Soc. de biol.*, Paris, 1911, tome
lxxi. p. 271.
" " *Ibid.*, 1911, p. 609.
" " *Compt. rend. Acad. d. Sc.*, Paris, 1911, tome
cliii. p. 1097.



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